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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/689,656 | 10/22/2003 | Mikhail Kejzelman | 003301-054 | 6495 |

21839 7590 01/24/2008
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POST OFFICE BOX 1404
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| EXAMINER | |
|---|---|
| KESSLER, CHRISTOPHER S | |
| ART UNIT | PAPER NUMBER |
| 1793 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 01/24/2008 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/689,656 | KEJZELMAN ET AL. | |
| | Examiner | Art Unit | |
| | Christopher Kessler | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *20-30,34-40,48 and 49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-30, 34-40 and 48-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Claims*

1. Responsive to the amendment filed 24 October 2007, claims 20 and 48 are amended and claims 50 and 51 are cancelled. Claims 20-30, 34-40, and 48-49 are currently under examination.

### *Status of Prior Rejections*

2. Applicant's amendments to the claims require new grounds for rejection, stated below.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 20-30, 34-40 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki in view of Rutz.

Regarding claim 20, Ozaki et al. discloses a method for preparing high density green compacts comprising subjecting an iron powder composition that is essentially without fine particles to uniaxial compaction (see Detailed Description, Examples, Table 1, powder A1, for example). Ozaki teaches that the powder used is preferably of a large particle size such that more than 70% of the particles are at least 106 μm in size (see Detailed Description). Less than 2% of the particles are smaller than 150 μm, meaning that less than 2% of the particles are less than 45 μm in size.

Ozaki discloses adding zinc stearate powder to the iron powder for compaction in amounts that fall within the range of about 0.05% and about 0.6% by weight (see col.14, lines 52-60). Ozaki further discloses die compaction of the iron powder at pressures of 1,177 Mpa (see Examples 1-1 and 1-2).

Ozaki does not disclose ejecting the green body from the die. However, the practice of ejecting the compact from the die after pressing would have been obvious to one of ordinary skill in the art, in order to densify the green body by heat treatment, for example.

Ozaki teaches that the powder may be water atomized iron powder (see Table 1, cols. 8-9). Ozaki teaches wherein the powder may be mixed with powdered alloying

elements (see cols. 7-8). Ozaki does not disclose wherein the powder is a water-atomized, completely alloyed steel powder.

However, the use of a completely alloyed powder would have been obvious to one of ordinary skill in the art as equivalent to the powder admixed with alloying elements as taught by Ozaki. For example, Rutz et al. discloses a process for die compaction of an iron based powder, and lists results from compacting Ancorsteel ® 4600V powder (see Table 2). Rutz also teaches that the alloying elements of the iron powder are chosen to correspond to desired properties in the final metal part (see col. 3, lines 2-4). Rutz teaches that the iron based powder may be an admixture of iron and alloying elements, or a water-atomized, completely alloyed steel powder.

It would have been obvious to one skilled in the art to use the completely alloyed steel as disclosed in Rutz et al., cited above, as the base composition of the iron powder used in the compaction steps disclosed in Ozaki et al. as an art-recognized equivalent (see Rutz et al., cited above).

Regarding claim 21, Ozaki teaches addition of graphite and other elements to iron powder containing fines before compaction, for alloying the powder (see Example 2). It would have been obvious to one of skill in the art at time of invention to add the graphite to create alloys suitable for parts with high mechanical sxtregth, as taught by Ozaki et al. (see Example 2).

Regarding claim 22, Ozaki discloses a process wherein the compaction is performed in a single step (see col. 2, lines 26-29).

Regarding claim 23, Ozaki discloses iron powders in which at least about 50% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 24, Ozaki discloses iron powders in which at least about 60% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 25, Ozaki discloses iron powders in which at least about 70% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 26, Ozaki discloses iron powders in which at least about 50% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A15).

Regarding claim 27, Ozaki discloses iron powders in which 50.1% of the particles are 250-1000 μm, and 35.2% of the particles are 180-250 μm (see Table 1, powder A15). The limitation that at least about 60% of the powder consists of particles having a particle size above about 212 μm would be obvious to one of ordinary skill in the art.

Regarding claim 28, Ozaki discloses iron powders in which 50.1% of the particles are 250-1000 μm, and 35.2% of the particles are 180-250 μm (see Table 1, powder A15). The limitation that at least about 70% of the powder consists of particles having a particle size above about 212 μm would be obvious to one of ordinary skill in the art.

Regarding claim 29, Ozaki discloses a maximum particle size of about 1 mm, for the reason that the larger particles will preferentially sit at corners and die walls, resulting in porosity in corresponding areas of the green body. There is no evidence that the limitation of 2 mm as maximum particle size is a critical value (see MPEP §2144.05 IIB). In fact, applicant's specification states that less than 5% of the particles have size of 417 μm (page 3, last paragraph), teaching away from a 2 mm maximum particle size.

Regarding claim 30, Ozaki discloses amounts of graphite which fall within applicant's claimed range of 0.1-1.0% (see Table 6).

Regarding claim 34, Ozaki discloses mixing alloying elements with the iron powder before compaction (see Example 2).

Regarding claims 35-37, Ozaki discloses compaction at pressure of 1177 Mpa.

Regarding claim 38, Ozaki discloses die compaction to be performed at room temperature (see col. 2, lines 26-29).

Regarding claim 39, Ozaki is silent with regard to compaction being performed at elevated temperature.

Rutz et al. discloses compaction being performed at elevated temperature (see claim 1, or col. 1, lines 23-34, for example).

It would have been obvious to one skilled in the art to use compaction at an elevated temperature, as taught by Rutz et al., cited above, to compact the powder disclosed in Ozaki et al. in order to improve density and strength at lower compaction pressures, as taught by Rutz, et al (col. 1, lines 23-34).

Regarding claim 40, Ozaki discloses sintering the green body at temperature of 1250 °C (see Example 2).

Regarding claim 48, Ozaki discloses mixing alloying elements including Ni, Cu and Mo with the iron powder before compaction (see Example 2).

Regarding claim 49, Ozaki discloses the addition of zinc stearate, a commonly used lubricant, to the powder (see Example 1-2). It would have been obvious to one of ordinary skill in the art at time of invention to use the compaction without external lubrication in order to save processing steps.

5. Claims 20-25, 30, 34-40 and 48-49 rejected under 35 U.S.C. 103(a) as being unpatentable over Rutz in view of US 3,901,661 issued to Kondo et al. (hereinafter "Kondo").

Regarding claim 20, Rutz teaches the invention substantially as claimed. Rutz teaches a process for preparing high-density green compacts (see Summary of the Invention, Detailed Description). Rutz teaches wherein the powder is a water-atomized, completely alloyed steel powder (see col. 3).

Rutz teaches that a lubricant is added to the steel powder (see Summary, Detailed Description, cols. 5-6 for example). Rutz teaches that the powder preferably contains 0.1 to about 10 weight % lubricant (see col. 2 and col. 5), said range overlapping the range claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a lubricant content

in the claimed range, because Rutz teaches the same utility over an overlapping range of lubricants. Applicant is further directed to MPEP 2144.05.

Rutz teaches that the compaction force is preferably in the range of about 276-1379, or more preferably about 345-828 MPa (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 800 MPa, because Rutz teaches that the pressure is preferably 345-828 MPa. Applicant is further directed to MPEP 2144.05.

Rutz teaches that the compact is ejected from the die (see cols. 5-6, cols. 8-9).

Rutz does not teach wherein less than about 5% of the powder particles have a size below 45 μm. Rutz teaches that the weight average particle size of the powder is from 1-1000 microns, more desirably 10-500 microns and that the maximum particle size is desirably less than 350 microns (see col. 3). Rutz teaches that a variety of other powders including pre-alloyed steel powders may be used in the invention (see cols. 2-3).

Kondo teaches a water-atomized pre-alloyed steel powder (see abstract, cols. 7-8, claim 1). Kondo teaches that the particle size distribution of the steel powder is such that 2% of the power is smaller than 325 mesh, thus meeting the limitation wherein less than about 5% of the powder particles have a size below 45 μm.

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz while using the water-atomized, completely

alloyed steel powder of Kondo, because Kondo teaches that compacts made from the powder will exhibit excellent hardenability and mechanical properties (see cols. 3-4).

Regarding claim 21, Rutz teaches mixing the powder with graphite and other additives (see cols. 5-6, for example), said process step being well established in the art of powder metallurgy.

Regarding claim 22, Rutz teaches compaction in a single step (see cols. 5-7), said process step being well established in the art of powder metallurgy.

Regarding claim 23, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches that the powder contains more than 50% particles of size greater than 106 μm (see col. 8).

Regarding claim 24, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches that the powder contains more than 60% particles of size greater than 106 μm (see col. 8).

Regarding claim 25, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches wherein the powder contains about 70% particles of size greater than 106 μm (see col. 8).

Regarding claim 30, Rutz teaches to add graphite at about 0.5% (see col. 6), said process step being well established in the art of powder metallurgy.

Regarding claim 34, Rutz teaches wherein the iron powder can be mixed with alloying elements (see cols. 2-3, col. 7, Table III, for example) to obtain a desired final composition.

Regarding claim 35, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 900 MPa, because Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 36, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 1000 MPa, because Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 37, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 1100 MPa, because Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 38, Rutz teaches wherein the compaction is performed at ambient temperature (see cols. 6-9).

Regarding claim 39, Rutz teaches wherein the compaction is performed at elevated temperature (see cols. 6-9).

Regarding claim 40, Rutz teaches that the compact is sintered at a temperature of over 1100°C (see col. 6), said process step being well established in the art of powder metallurgy.

Regarding claim 48, Rutz teaches wherein the alloying elements may be Ni (see cols. 2-3, col. 7, Table III, for example).

Regarding claim 49, Rutz does not disclose wherein the die is lubricated (external lubrication). The choice of lubricating (or not lubricating the die is well established in the art. It would have been obvious to one of ordinary skill in the art at time of invention to use the compaction without external lubrication in order to save processing steps.

***Response to Arguments***

6. Applicant's arguments filed 24 October 2007 have been fully considered but they are not persuasive. Applicant has argued that Ozaki does not suggest or teach the use of a completely alloyed steel powder. Applicant has argued that Rutz does not teach the claimed particle size distribution. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re*

*Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While the examiner agrees Ozaki does not teach a completely alloyed steel powder, and Rutz does not teach the claimed particle size distribution, the combination of teachings of the prior art would have made this feature obvious as stated above.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine teachings is stated above.

In response to applicant's argument that Rutz and Ozaki are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would have looked to Rutz, because both references are directed to making iron-based compacts from iron-based starting powders.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Kessler whose telephone number is (571) 272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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